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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/800,230

03/12/2004

Kazuhito Matsuda

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8565

959 7590 11/17/2008

LAHIVE & COCKFIELD, LLP  
FLOOR 30, SUITE 3000  
ONE POST OFFICE SQUARE  
BOSTON, MA 02109

EXAMINER

LAIOS, MARIA J

ART UNIT

PAPER NUMBER

1795

MAIL DATE

DELIVERY MODE

11/17/2008

PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/800,230	<b>Applicant(s)</b> MATSUDA ET AL.	
	<b>Examiner</b> MARIA J. LAIOS	<b>Art Unit</b> 1795	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 7/17/2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1,3,4,6 and 7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 3,4,6,7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |                                                                                        |                                                                   |
|----------------------------------------------------------------------------------------|-------------------------------------------------------------------|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                       | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>20081009</u> .                                                | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### *Response to Amendment*

This office action is in response to the amendment filed 17 July 2008. Claims 1 and 4 have been amended. Claims 1, 3, 4, 6 and 7 are pending.

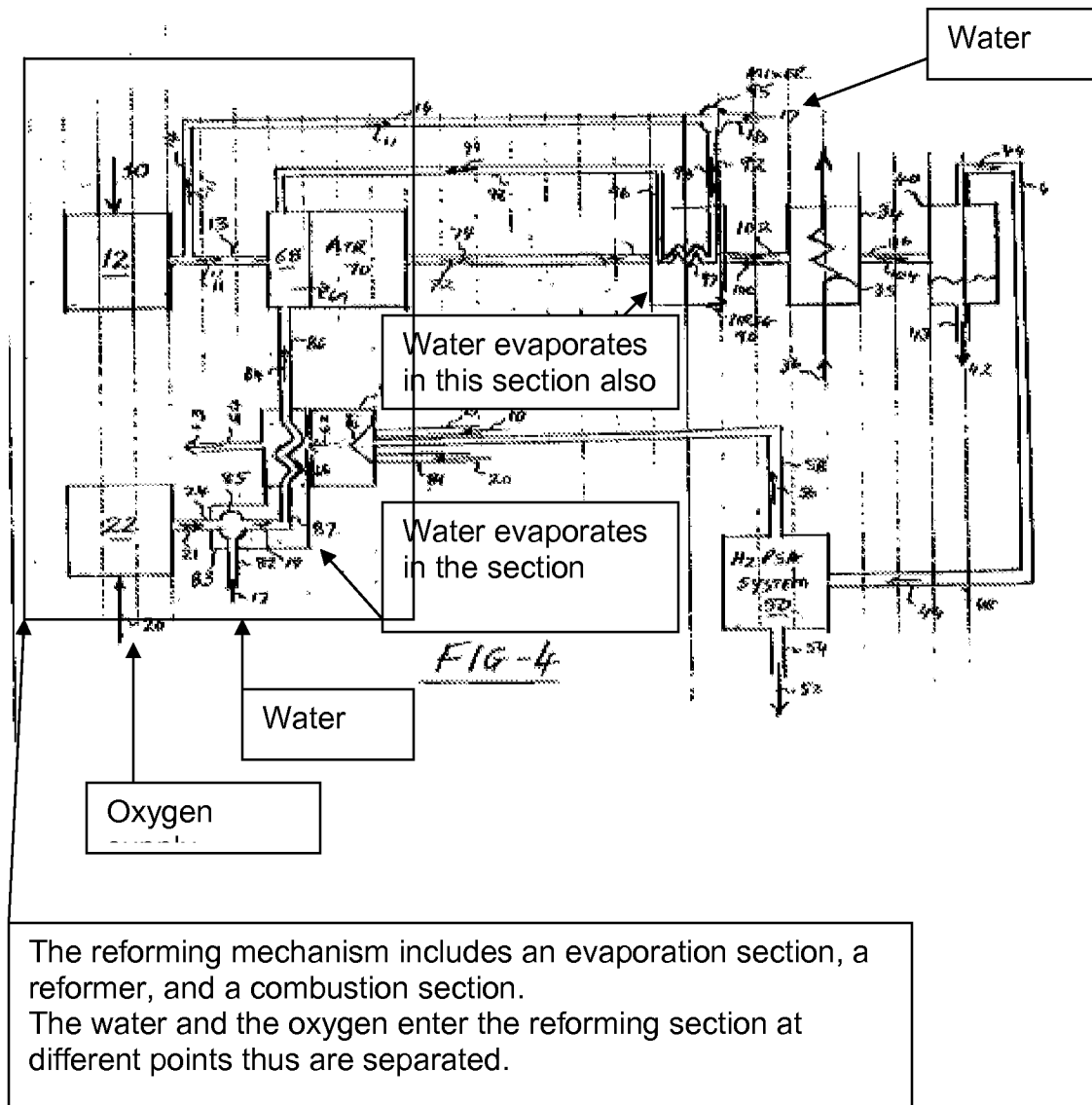
### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1, 3, 4 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Woods in view of Joshi and Kubo (JP 02-160601)

Woods discloses a fuel gas production apparatus for reforming a hydrogen containing fuel to produce a hydrogen rich fuel gas comprising a reforming mechanism which includes an auto thermal reforming system (ATR, 70, Paragraph 24) and an evaporator (Paragraph 20-evaporates the liquid water in mixture 19), a PSA mechanism (50), a cooling mechanism (90, 34, 40) that is provided between the ATR (70, part of the reforming mechanism) and the PSA system (70). The fuel in the system is a light hydrocarbon such as methane (paragraph 19). The oxygen (20) separately enters the reforming system from the water (see figure below). Woods further discloses the hydrogen generating system for use in fuel cell applications (Paragraph 2).



Woods fails to disclose an off-gas tank connected to the evaporator. Joshi is analogous to Woods because both disclose the use of a PSA system in a hydrogen production. Joshi teaches that PSA systems produce a waste gas stream for recycling to a burner and that a surge tank is used to even out cyclic pressure fluctuation (Paragraph 4). It would have been obvious to one of ordinary skill in the art to include the surge tank of Joshi to the system of Woods

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because this evens out the cyclic pressure fluctuations caused by the PSA system.

Woods modified by Joshi disclose the fuel production system as is discussed above but fails to disclose that the evaporator for changing water into steam before the steam mixes with the hydrogen containing fuel.

Kubo discloses a hydrogen production plant and teaches a water evaporator (18) for evaporating the water in order to prevent the deposition of carbon in an evaporator by using a catalytic combustor system and separately feeding methanol and water (abstract). Therefore it would have been obvious to one of ordinary skill in the art at the time of the invention to separately produce the steam from the water because this would prevent a deposition of carbon. Furthermore by separating the generation of steam and fuel processes it allows for more control of the system since only one of the reactants (steam or fuel) would need to be adjusted to maintain a balanced system in the reactor.

3. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Woods (US 2003/0046867 A1) in view of Joshi (US 2004/0146821 A1) and Kubo (JP 02-160601) as applied to claim 4 above, and further in view of Margiott et al. (US 2003/0087138 A1).

Woods modified by Joshi and Kubo disclose a fuel cell with the fuel producing apparatus as discussed above and incorporated here in but fail to disclose an air blower for supplying air to the fuel cell. Margiott et al. discloses a fuel cell and teaches that an air blower (134) is used to pump air through the

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cathode flow field (Paragraph 25). It would have been obvious to one of ordinary skill in the art at the time of the invention to include the air blow of Margiott et al. to the fuel cell system of Wood modified by Joshi and Kubo in order to provide air to the cathode flow field.

### ***Response to Arguments***

4. Applicant's arguments with respect to claims 1 and 4 have been considered but are moot in view of the new ground(s) of rejection as necessitated by amendment.

Applicant argues that Woods and Joshi do not teach an evaporator for turning water into steam prior to the mixing of hydrogen containing fuel or oxidant. However Kubo teaches that by changing water into steam separately from the hydrogen containing fuel deposition of carbon in an evaporator is prevented. Furthermore by separately controlling the steam and hydrogen containing fuel adjustments can be made to the feed entering the reformer more easily than a combined feed input to the reformer.

### ***Conclusion***

5. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARIA J. LAIOS whose telephone number is (571)272-9808. The examiner can normally be reached on Monday - Thursday 10 am -7 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on 571-272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/M. J. L./  
Examiner, Art Unit 1795

/Dah-Wei D. Yuan/  
Supervisory Patent Examiner, Art Unit 1795